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PATENT COOPERATION TREATY

2458-4042 PC

From the INTERNATIONAL BUREAU

M. Morry

PCT

NOTICE INFORMING THE APPLICANT OF THE  
COMMUNICATION OF THE INTERNATIONAL  
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:

MOROZ, Eugene  
Morgan & Finnegan, L.L.P.  
345 Park Avenue  
New York, NY 10154  
ETATS-UNIS D'AMERIQUE

2458-4042 PC ATTY MMY  
Dec. 25, 2001 (Chp. II Nat'l Filing)  
(Reminder)

Date of mailing (day/month/year) 04 January 2001 (04.01.01)		
Applicant's or agent's file reference 2458-4042PC		
International application No. PCT/US00/17540	International filing date (day/month/year) 26 June 2000 (26.06.00)	Priority date (day/month/year) 25 June 1999 (25.06.99)
Applicant GENAISSANCE PHARMACEUTICALS, INC. et al		

IMPORTANT NOTICE

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:  
AG,AU,BZ,DZ,KP,KR,MZ,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE,AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,CA,CH,CN,CR,CU,CZ,DE,DK,DM,EA,EE,EP,ES,FI,GB,GD,  
GE,GH,GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MA,MD,MG,MK,MN,MW,MX,  
NO,NZ,OA,PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,TZ,UA,UG,UZ,VN,YU,ZA,ZW

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on  
04 January 2001 (04.01.01) under No. WO 01/01218

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer J. Zahra
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.83.38

APPLICATION NO. (if known, see 37 C.F.R. 1.51) <div style="font-size: 2em; font-weight: bold; margin-left: 50px;">10/019242</div>		INTERNATIONAL APPLICATION NO. <div style="text-align: center; font-weight: bold;">PCT/US00/17540</div>		ATTORNEY'S DOCKET NUMBER <div style="text-align: center; font-weight: bold;">2458-4042US2</div>	
21. <input checked="" type="checkbox"/> The following fees are submitted: <b>BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5) ):</b> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2) paid to USPTO and International Search Report not prepared by the EPO or JPO.....\$1000.00  International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO.....\$860.00  International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2) paid to USPTO...\$710.00  International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33 (1) - (4).....\$690.00  International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1) - (4).....\$100.00  <div style="text-align: center; font-weight: bold;">ENTER APPROPRIATE BASIC FEE AMOUNT =</div>				<b>CALCULATIONS</b> <b>PTO USE ONLY</b>          <div style="border: 1px solid black; width: 100%; height: 100%;"></div>	
Surcharge of \$130 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).					
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	17 - 20 =	0	X \$18.00	\$---	
Independent claims	4 - 3 =	1	X \$84.00	\$ 84.00	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$280.00	\$---	
TOTAL OF ABOVE CALCULATIONS =				\$774.00	
<input type="checkbox"/> Applicant claims small entity status. See 37 C.F.R. 1.27. The fees indicated above are reduced by 1/2.					
SUBTOTAL =				\$774.00	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).					
TOTAL NATIONAL FEE =				\$774.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31).      \$40.00 per property X =					
TOTAL FEES ENCLOSED =				\$	
				Amount to be refunded:	\$
				charged:	\$
a. <input type="checkbox"/> A check in the amount of \$ _____ to cover the above fees is enclosed. b. <input checked="" type="checkbox"/> Please charge my Deposit Account No. 13-4500, ORDER NO. 2458-4042US2 in the amount of \$774.00 to cover the above fees. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required; or credit any overpayment to Deposit Account No. 13-4500, ORDER NO. 2458-4042US2. A duplicate copy of this sheet is enclosed. d. <input type="checkbox"/> Fees are to be charged to a credit card. <b>WARNING:</b> Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038. <b>NOTE:</b> Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.					
SEND ALL CORRESPONDENCE TO:  <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">           Morgan &amp; Finnegan LLP            345 Park Avenue            New York, NY 10154-0053            Telephone: 212-758-4800            Telecopier: 212-751-6849         </div> <div style="width: 45%; text-align: center;">           Signature _____  <div style="font-size: 1.5em; font-family: cursive; margin: 5px 0;">James P. Demers</div>           James P. Demers             Registration No. 34,320         </div> </div>					

# PATENT COOPERATION TREATY

2458-7642 PCT/US00/17540

WO

PCT

From the INTERNATIONAL BUREAU

## NOTIFICATION OF RECEIPT OF RECORD COPY

(PCT Rule 24.2(a))

To:

MOROZ, Eugene  
Morgan & Finnegan, L.L.P.  
345 Park Avenue  
New York, NY 10154  
ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year) 01 August 2000 (01.08.00)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference 2458-4042PC	International application No. PCT/US00/17540

The applicant is hereby notified that the International Bureau has received the record copy of the international application as detailed below.

Name(s) of the applicant(s) and State(s) for which they are applicants:

GENAISSANCE PHARMACEUTICALS, INC. (for all designated States except US)  
DENTON, Richard, Rex et al (for US)

International filing date : 26 June 2000 (26.06.00)

Priority date(s) claimed : 25 June 1999 (25.06.99)

Date of receipt of the record copy  
by the International Bureau : 18 July 2000 (18.07.00)

List of designated Offices :

AP : GH,GM,KE,LS,MW,MZ,SD,SL,SZ,TZ,UG,ZW

EA : AM,AZ,BY,KG,KZ,MD,RU,TJ,TM

EP : AT,BE,CH,CY,DE,DK,ES,FI,FR,GB,GR,IE,IT,LU,MC,NL,PT,SE

OA : BF,BJ,CF,CG,CI,CM,GA,GN,GW,ML,MR,NE,SN,TD,TG

National : AE,AG,AL,AM,AT,AU,AZ,BA,BB,BG,BR,BY,BZ,CA,CH,CN,CR,CU,CZ,DE,DK,DM,DZ,EE,  
ES,FI,GB,GD,GE,GH,GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KP,KR,KZ,LC,LK,LR,LS,LT,LU,LV,MA,  
MD,MG,MK,MN,MW,MX,MZ,NO,NZ,PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,TZ,UA,UG,US,  
UZ,VN,YU,ZA,ZW

### ATTENTION

The applicant should carefully check the data appearing in this Notification. In case of any discrepancy between these data and the indications in the international application, the applicant should immediately inform the International Bureau.

In addition, the applicant's attention is drawn to the information contained in the Annex, relating to:

- ☒ time limits for entry into the national phase
- ☐ confirmation of precautionary designations
- ☒ requirements regarding priority documents

A copy of this Notification is being sent to the receiving Office and to the International Searching Authority.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer:  V. Gross
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.83.38

## INFORMATION ON TIME LIMITS FOR ENTERING THE NATIONAL PHASE

The applicant is reminded that the "national phase" must be entered before each of the designated Offices indicated in the Notification of Receipt of Record Copy (Form PCT/IB/301) by paying national fees and furnishing translations, as prescribed by the applicable national laws.

The time limit for performing these procedural acts is **20 MONTHS** from the priority date or, for those designated States which the applicant elects in a demand for international preliminary examination or in a later election, **30 MONTHS** from the priority date, provided that the election is made before the expiration of 19 months from the priority date. Some designated (or elected) Offices have fixed time limits which expire even later than 20 or 30 months from the priority date. In other Offices an extension of time or grace period, in some cases upon payment of an additional fee, is available.

In addition to these procedural acts, the applicant may also have to comply with other special requirements applicable in certain Offices. **It is the applicant's responsibility** to ensure that the necessary steps to enter the national phase are taken in a timely fashion. Most designated Offices do not issue reminders to applicants in connection with the entry into the national phase.

For detailed information about the procedural acts to be performed to enter the national phase before each designated Office, the applicable time limits and possible extensions of time or grace periods, and any other requirements, see the relevant Chapters of Volume II of the PCT Applicant's Guide. Information about the requirements for filing a demand for international preliminary examination is set out in Chapter IX of Volume I of the PCT Applicant's Guide.

GR and ES became bound by PCT Chapter II on 7 September 1996 and 6 September 1997, respectively, and may, therefore, be elected in a demand or a later election filed on or after 7 September 1996 and 6 September 1997, respectively, regardless of the filing date of the international application. (See second paragraph above.)

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

## CONFIRMATION OF PRECAUTIONARY DESIGNATIONS

This notification lists only specific designations made under Rule 4.9(a) in the request. It is important to check that these designations are correct. Errors in designations can be corrected where precautionary designations have been made under Rule 4.9(b). The applicant is hereby reminded that any precautionary designations may be confirmed according to Rule 4.9(c) before the expiration of 15 months from the priority date. If it is not confirmed, it will automatically be regarded as withdrawn by the applicant. There will be no reminder and no invitation. Confirmation of a designation consists of the filing of a notice specifying the designated State concerned (with an indication of the kind of protection or treatment desired) and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.

## REQUIREMENTS REGARDING PRIORITY DOCUMENTS

For applicants who have not yet complied with the requirements regarding priority documents, the following is recalled.

Where the priority of an earlier national, regional or international application is claimed, the applicant must submit a copy of the said earlier application, certified by the authority with which it was filed ("the priority document") to the receiving Office (which will transmit it to the International Bureau) or directly to the International Bureau, before the expiration of 16 months from the priority date, provided that any such priority document may still be submitted to the International Bureau before that date of international publication of the international application, in which case that document will be considered to have been received by the International Bureau on the last day of the 16-month time limit (Rule 17.1(a)).

Where the priority document is issued by the receiving Office, the applicant may, instead of submitting the priority document, request the receiving Office to prepare and transmit the priority document to the International Bureau. Such request must be made before the expiration of the 16-month time limit and may be subjected by the receiving Office to the payment of a fee (Rule 17.1(b)).

If the priority document concerned is not submitted to the International Bureau or if the request to the receiving Office to prepare and transmit the priority document has not been made (and the corresponding fee, if any, paid) within the applicable time limit indicated under the preceding paragraphs, any designated State may disregard the priority claim, provided that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity to furnish the priority document within a time limit which is reasonable under the circumstances.

Where several priorities are claimed, the priority date to be considered for the purposes of computing the 16-month time limit is the filing date of the earliest application whose priority is claimed.

## PATENT COOPERATION TREATY

2458-4042 PC

From the INTERNATIONAL BUREAU

MJM.

PCT

NOTIFICATION CONCERNING  
SUBMISSION OR TRANSMITTAL  
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

To:

2000 NOV -3 A 10:33

MOROZ, Eugene  
Morgan & Finnegan, L.P.  
345 Park Avenue  
New York, NY 10154  
ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year) 23 October 2000 (23.10.00)	
Applicant's or agent's file reference 2458-4042PC ✓	IMPORTANT NOTIFICATION
International application No. PCT/US00/17540 ✓	International filing date (day/month/year) 26 June 2000 (26.06.00) ✓
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 25 June 1999 (25.06.99) ✓
Applicant GENAISSANCE PHARMACEUTICALS, INC. et al	

- The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
- This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
- An asterisk(\*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
- The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
25 June 1999 (25.06.99)	60/141,521	US	07 Augu 2000 (07.08.00)

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer

Magda BOUACHA

Telephone No. (41-22) 338.83.38

2458-4042 PC  
Morry

PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:  
EUGENE MOROZ  
MORGAN & FINNEGAN, L.L.P.  
345 PARK AVENUE  
NEW YORK, NY 10154

PCT

NOTIFICATION OF RECEIPT  
OF DEMAND BY COMPETENT INTERNATIONAL  
PRELIMINARY EXAMINING AUTHORITY

(PCT Rules 59.3(e) and 61.1(b), first sentence  
and Administrative Instructions, Section 601(a))

Date of mailing  
(day/month/year)

08 JUN 2001

Applicant's or agent's file reference

2458-4042PC

IMPORTANT NOTIFICATION

International application No.

PCT/US00/17540

International filing date (day/month/year)

26 JUN 00

Priority date (day/month/year)

25 JUN 99

Applicant

GENAISSANCE PHARMACEUTICALS, INC.

1. The applicant is hereby **notified** that this International Preliminary Examining Authority considers the following date as the date of receipt of the demand for international preliminary examination of the international application:

25 January 2001

2. That date of receipt is:

- ☒ the actual date of receipt of the demand by this Authority (Rule 61.1(b)).  
☐ the actual date of receipt of the demand on behalf of this Authority (Rule 59.3(e)).  
☐ the date on which this Authority has, in response to the invitation to correct defects in the demand (Form PCT/IPEA/404), received the required corrections.

3. ☐ **ATTENTION:** That date of receipt is **AFTER** the expiration of 19 months from the priority date. Consequently, the election(s) made in the demand does (do) not have the effect of postponing the entry into the national phase until 30 months from the priority date (or later in some Offices) (Article 39(1)). Therefore, the acts for entry into the national phase must be performed within 20 months from the priority date (or later in some Offices) (Article 22). For details, see the *PCT Applicant's Guide*, Volume II.

- ☐ (If applicable) This notification confirms the information given by telephone, facsimile transmission or in person on:

4. Only where paragraph 3 applies, a copy of this notification has been sent to the International Bureau.

Name and mailing address of the IPEA/  
Assistant Commissioner for Patent  
Box PCT  
Washington, D.C. 20231 Attn:RO/US  
Facsimile No. 703-305-3230

Authorized officer  
Melvin S. Brooks Sr.

Telephone No. 703-305-5163

Duplicate . , g.

2458-4042 PC

Morry

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
4 January 2001 (04.01.2001)

PCT

(10) International Publication Number  
**WO 01/01218 A3**

(51) International Patent Classification<sup>7</sup>: G06F 7/00,  
17/00, G01N 33/48, 33/50, G06T 1/00

Andreas, K. [DE/US]; 91 Center Road, Woodbridge, CT 06524 (US). XU, Chuanbo [CN/US]; 524 Openint Hill Road, Madison, CT 06443 (US).

(21) International Application Number: PCT/US00/17540

(22) International Filing Date: 26 June 2000 (26.06.2000)

(74) Agents: MOROZ, Eugene et al.; Morgan & Finnegan, L.L.P., 345 Park Avenue, New York, NY 10154 (US).

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/141,521 25 June 1999 (25.06.1999) US

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(63) Related by continuation (CON) or continuation-in-part (CIP) to earlier application:  
US 60/141,521 (CIP)  
Filed on 25 June 1999 (25.06.1999)

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (*for all designated States except US*): GENAIS-SANCE PHARMACEUTICALS, INC. [US/US]; Five Science Park, New Haven, CT 06511 (US).

Published:

— With international search report.

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): DENTON, Richard, Rex [US/US]; 129 Hunters Trail, Madison, CT 06443 (US). JUDSON, Richard, S. [US/US]; 42 Baker Hill Drive, Guilford, CT 06437 (US). RUAÑO, Gualberto [US/US]; 88 Lawrence Street, New Haven, CT 06511 (US). STEPHENS, Joel, Claiborne [US/US]; 46 Crabapple Lane, Guilford, CT 06437 (US). WINDEMUTH,

(88) Date of publication of the international search report:  
7 June 2001

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: METHODS FOR OBTAINING AND USING HAPLOTYPE DATA

(57) Abstract: Methods, computer program(s) and database(s) to analyze and make use of gene haplotype information. These include methods, program, and database to find and measure the frequency of haplotypes in the general population; methods, program, and database to find correlation's between an individual's haplotypes r genotypes and a clinical outcome; methods, program, and database to predict an individual's haplotypes from the individual's genotype for a gene; and methods, program, and database to predict an individual's clinical response to a treatment based on the individual's genotype or haplotype.



WO 01/01218 A3



# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/17540

## C (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,773,220 A (DEKOSKY ET AL) 30 June 1998 (30-06-98), see in particular abstract and claims.	1-21,30-33,35,43- 51,53-58,69-78,83- 84,86,94-102,104- 109,120-129,134- 135,137,145-15 3,155-160,171-183
Y,P	US 5,972,614 A (RUANO ET AL) 26 October 1999 (26-10-99), see in particular abstract; claims; column 6, lines 33-55; column 12, lines 10-25.	1-21,30-33,35,43- 51,53-58,69-78,83- 84,86,94-102,104- 109,120-129,134- 135,137,145-15 3,155-160, 171-183
Y, P	US 6,022,683 A (POIRIER) 08 February 2000 (08-02-00), see in particular abstract and claims.	1-21,30-33,35,43- 51,53-58,69-78,83- 84,86,94-102,104- 109,120-129,134- 135,137,145- 153,155-160, 171- 183
Y, P	US 6,043,040 A (ACTON) 28 March 2000 (28-03-00), see in particular abstract, claims, and columns 49-59.	1-21,30-33,35,43- 51,53-58,69-78,83- 84,86,94-102,104- 109,120-129,134- 135, 137,145- 153,155-160,171- 183
Y	US 5,648,482 A (MEYER) 15 July 1997 (15-07-97), see in particular abstract, claims, and columns 23-26.	1-21,30-33,35,43- 51,53-58,69- 78,8384,86,94- 102,104-109,120- 129,134-135,1 37,145-153,155- 160,171-183
Y, P	US 6,030,778 A (ACTON ET AL) 29 February 2000 (29-02-00), see in particular abstract, claims, and columns 25-30.	1-21,30-33, 35,43- 51,53-58,69-78,83- 84,86,94-102,104- 109,120-129,134- 135,137,145- 153,155-160,171- 183

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/17540

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 7/00, 17/00; G01N 33/48, 33/50; G06T 1/00

US CL : 345/418, 961; 702/19, 20; 707/100, 102, 104

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 345/418, 961; 702/19, 20; 707/100, 102, 104

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,874,256 A (BERTINA ET AL) 23 February 1999 (23-02-99), see in particular abstract and claims.	1-21,30-33, 35,43-51, 53-58, 69-78,83-84,86,94-102,104-109,120-129, 134-135, 137,145-153,155-160,171-183

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	* T	Later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
* A document defining the general state of the art which is not considered to be of particular relevance	* X	Document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
* E earlier document published on or after the international filing date	* Y	Document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
* L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	* A	Document member of the same patent family
* O document referring to an oral disclosure, use, exhibition or other means		
* P document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

14 NOVEMBER 2000

Date of mailing of the international search report

23 FEB 2001

Name and mailing address of the ISA/US  
Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

MARIANNE P. ALLEN

Telephone No. (703) 308-0196

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/17540

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CLARK et al. Haplotype Structure and Population Genetic Inferences from Nucleotide-Sequence Variation in Human Lipoprotein Lipase. American Journal of Human Genetics. 1998, Vol. 63, pages 595-912, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y	CASHMAN et al. The Irish cystic fibrosis database. Journal of Medical Genetics. 1995, Vol. 32, No. 12, pages 972-975, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y, P	TISHKOFF et al. The Accuracy of Statistical Methods for Estimation of Haplotype Frequencies: An Example from the CD4 Locus. American Journal of Human Genetics. August 2000, Vol. 67, No. 2, pages 518-522, see entire document.	1-21,30-33,35,43-51,53-58,69-78, 83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y	PERLIN et al. Toward Fully Automated Genotyping: Allele Assignment, Pedigree Construction, Phase Determination, and Recombination Detection in Duchenne Muscular Dystrophy. American Journal of Human Genetics. 1994, Vol. 55, No.4, pages 777-787, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y	HOANG et al. PAH Mutation Analysis Consortium Database: A Database for Disease-producing and Other Allelic Variation at the Human PAH Locus. Nucleic Acids Research. 1996, Vol. 24, No. 1, pages 127-131, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160, 171-183
Y, P	STEPHENS et al. Single-nucleotide Polymorphisms, Haplotypes, and Their Relevance to Pharmacogenetics. Molecular Diagnosis. December 1999, V L 4, No. 4, pages 309-317, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160, 171-183

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/17540

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KLEYN et al. Genetic Variation as a Guide to Drug Development. Science. 18 September 1998, Vol. 281, pages 1820-1821, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y	MORI et al. HLA Gene and Haplotype Frequencies in the North American Population. Transplantation. 15 October 1997, Vol. 64, No. 7, pages 1017-1027, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y	MORI et al. Computer program to predict likelihood of finding an HLA-matched donor. Methodology, validation, and application. Biology of Blood and Marrow Transplantation. October 1996, Vol. 2, pages 134-144, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y	MATISE, T. C. Genome Scanning for Complex Disease Genes Using the Transmission/Disequilibrium Test and Haplotype-based Haplotype Relative Risk. Genetic Epidemiology. 1995, Vol. 12, No. 6, pages 641-645, see entire document.	121,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y	COOPER et al. Network Analysis of Human Y Microsatellite Haplotypes. Human Molecular Genetics. 1996, Vol. 5, No. 11, pages 1759-1766, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y	GENE et al. Haplotype frequencies of eight Y-chromosome STR loci in Barcelona (North-East Spain). International Journal of Legal Medicine. 1999, Vol. 112, pages 403-405, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US00/17540

### B. FIELDS SEARCHED

Electronic data bases consulted (Name of data base and where practicable terms used):

DIALOG (files 5, 155) and EAST (files U.S. Patents, European abstracts, Japanese abstracts, and Derwent) search terms: pharmacogenomic, pharmacogenetic, haplotype, genotype, database, computer, clinical trial, population genetics, polymorphism, SNP, Hardy-Weinberg, Mendelian, linkage, phylogenetic, pedigree, locus, gene, phased, unphased

### BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING

This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

- Group I, claim(s) 1-8, 69-72, and 120-124, drawn to a method of generating a haplotype database, computer-usable medium, and computer programmed therefore.
- Group II, claim(s) 9-12 and 73, drawn to a method of predicting the presence of a haplotype and computer-usable medium therefore.
- Group III, claim(s) 13-21, 74-78, and 125-129, drawn to a method of identifying correlation between haplotype pair and clinical response, computer-usable medium, and computer programmed therefore.
- Group IV, claim(s) 22-29, 79-82, 130-133, drawn to a method for determining susceptibility to a condition/disease, computer-usable medium, and computer programmed therefore.
- Group V, claim(s) 30-33, 83-84, and 134-135, drawn to a method for predicting response to treatment, computer-usable medium, and computer programmed therefore.
- Group VI, claim(s) 34, 85, and 136, drawn to a method for generating a tree structure, computer-usable medium, and computer programmed therefore.
- Group VII, claim(s) 35, 86, and 137, drawn to a method for displaying haplotype pair frequency, computer-usable medium, and computer programmed therefore.
- Group VIII, claim(s) 36-37, 87-88, and 138-139, drawn to a method for displaying a linkage screen, computer-usable medium, and computer programmed therefore.
- Group IX, claim(s) 38-40, 89-91, and 140-142, drawn to a method for displaying a phylogenetic tree screen, computer-usable medium, and computer programmed therefore.
- Group X, claim(s) 41-42, 92-93, and 143-144, drawn to a method for displaying genotypic analysis, computer-usable medium, and computer programmed therefore.
- Group XI, claim(s) 43-51, 94-102, and 145-153, drawn to a method to displaying clinical response values, computer-usable medium, and computer programmed therefore.
- Group XII, claim(s) 52, 103, and 154, drawn to a method for carrying out a genetic algorithm, computer-usable medium, and computer programmed therefore.
- Group XIII, claim(s) 53, 104, and 155, drawn to a method for displaying correlations, computer-usable medium, and computer programmed therefore.
- Group XIV, claim(s) 54-55, 105-106, and 156-157, drawn to a method for conducting a clinical trial, computer-usable medium, and computer programmed therefore.
- Group XV, claim(s) 56-58, 107-109, and 158-160, drawn to a method for inferring genotype, computer-usable medium, and computer programmed therefore.
- Group XVI, claim(s) 59-68, 110-119, and 161-170, drawn to a method of determining polymorphic sites or subhaplotypes, computer-usable medium, and computer programmed therefore.
- Group XVII, claim(s) 171-175 and 183, drawn to a data structure.
- Group XVIII, claim(s) 176-182, drawn to a method for storing and organizing biological information.

The inventions listed as Groups I-XVIII do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The special technical feature of each method is the starting materials, method steps, and goal of each method. The corresponding computer-usable medium and computer programmed therefore form part of the inventive concept with each method. Note that PCT Rule 13 does not provide for multiple methods or products.

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US00/17540

**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:  
1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest



The additional search fees were accompanied by the applicant's protest.



No protest accompanied the payment of additional search fees.

# PATENT COOPERATION TREATY

2458-4042 PC  
Morry

From the INTERNATIONAL SEARCHING AUTHORITY

## PCT

### NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

<b>To:</b> EUGENE MOROZ MORGAN & FINNEGAN, L.L.P. 345 PARK AVENUE NEW YORK, NEW YORK 10154		<b>Date of Mailing</b> (day/month/year) <span style="font-size: 1.2em;">23 FEB 2001</span>
<b>CASE</b> <u>2458-4042 PC</u> <b>ATTY</b> <u>MSM</u> <b>DUE</b> <u>May 23, 2001 (U.S. Suppl. IDS)</u> <b>1 mo. call-up</b> <u>April 23, 2001</u> <b>BY</b> <u>J.M.</u>		<b>FOR FURTHER ACTION</b> See paragraphs 1 and 4 below
<b>Applicant's or agent's file reference</b> 2458-4042PC		
<b>International application No.</b> PCT/US00/17540		
<b>Applicant</b> GENAISSANCE PHARMACEUTICALS, INC.		<b>International filing date</b> (day/month/year) <span style="font-size: 1.2em;">26 JUNE 2000</span>

1. ☒ The applicant is hereby notified that the international search report has been established and is transmitted herewith.

**Filing of amendments and statement under Article 19:**

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

**When?** The time limit for filing such amendments is normally 2 months from the date of transmittal of the international search report; however, for more details, see the notes on the accompanying sheet.

**Where?** Directly to the International Bureau of WIPO  
 34, chemin des Colombettes  
 1211 Geneva 20, Switzerland  
 Facsimile No.: (+1-22) 740.14.35

CASE 2458-4042 PC **ATTY** MSM  
**DUE** April 23, 2001 **Art-19**  
**1 mo. call-up** March 23, 2001  
**BY** J.M.

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in rules 90 bis 1 and 90 bis 3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

<b>Name and mailing address of the ISA/US</b> Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 <b>Facsimile No.</b> (703) 305-3230	<b>Authorized officer</b> MARIANNE P. ALLEN <i>Dorothea Lawrence</i> For <b>Telephone No.</b> (703) 308-0196
---	---

# PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: EUGENE MOROZ  
MORGAN & FINNEGAN, L.L.P.  
345 PARK AVENUE  
NEW YORK, NEW YORK 10154

## PCT

### NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

Date of Mailing  
(day/month/year)

23 FEB 2001

Applicant's or agent's file reference  
2458-4042PC

FOR FURTHER ACTION See paragraphs 1 and 4 below

International application No.  
PCT/US00/17540

International filing date  
(day/month/year)  
26 JUNE 2000

Applicant  
GENAISSANCE PHARMACEUTICALS, INC.

1. ☒ The applicant is hereby notified that the international search report has been established and is transmitted herewith.

**Filing of amendments and statement under Article 19:**

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

**When?** The time limit for filing such amendments is normally 2 months from the date of transmittal of the international search report; however, for more details, see the notes on the accompanying sheet.

**Where?** Directly to the International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland  
Facsimile No.: (+1-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in rules 90 bis 1 and 90 bis 3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the ISA/US  
Commissioner of Patents and Trademarks  
Box POT  
Washington, D.C. 20231  
Facsimile No. (703) 305-3230

Authorized officer

MARIANNE P. ALLEN  
*Dorothea Lawrence*  
Telephone No. (703) 308-0196



# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>2458-4042PC</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/US00/17540</b>	International filing date ( <i>day/month/year</i> ) <b>26 JUNE 2000</b>	(Earliest) Priority Date ( <i>day/month/year</i> ) <b>25 JUNE 1999</b>
Applicant <b>GENAISSANCE PHARMACEUTICALS, INC.</b>		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 7 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 25.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the
- ☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☒ Unity of invention is lacking (See Box II).

4. With regard to the **title**,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No. \_\_\_\_\_

- ☐ as suggested by the applicant.
- ☐ because the applicant failed to suggest a figure.
- ☐ because this figure better characterizes the invention.

☒ None of the figures.

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/17540

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:  
1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☒  
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

 International application No.  
 PCT/US00/17540
**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) : G06F 7/00, 17/00; G01N 33/48, 33/50; G06T 1/00

US CL : 345/418, 961; 702/19, 20; 707/100, 102, 104

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 345/418, 961; 702/19, 20; 707/100, 102, 104

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,874,256 A (BERTINA ET AL) 23 February 1999 (23-02-99), see in particular abstract and claims.	1-21,30-33, 35,43-51, 53-58, 69-78,83-84,86,94-102,104-109,120-129, 134-135, 137, 145-153,155-160, 171-183

☒ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

14 NOVEMBER 2000

Date of mailing of the international search report

23 FEB 2001

 Name and mailing address of the ISA/US  
 Commissioner of Patents and Trademarks  
 Box PCT  
 Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

MARIANNE P. ALLEN

Telephone No. (703) 308-0196

## INTERNATIONAL SEARCH REPORT

 International application No.  
 PCT/US00/17540

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,773,220 A (DEKOSKY ET AL) 30 June 1998 (30-06-98), see in particular abstract and claims.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y,P	US 5,972,614 A (RUANO ET AL) 26 October 1999 (26-10-99), see in particular abstract; claims; column 6, lines 33-55; column 12, lines 10-25.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160, 171-183
Y, P	US 6,022,683 A (POIRIER) 08 February 2000 (08-02-00), see in particular abstract and claims.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160, 171-183
Y, P	US 6,043,040 A (ACTON) 28 March 2000 (28-03-00), see in particular abstract, claims, and columns 49-59.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135, 137,145-153,155-160,171-183
Y	US 5,648,482 A (MEYER) 15 July 1997 (15-07-97), see in particular abstract, claims, and columns 23-26.	1-21,30-33,35,43-51,53-58,69-78,8384,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y, P	US 6,030,778 A (ACTON ET AL) 29 February 2000 (29-02-00), see in particular abstract, claims, and columns 25-30.	1-21,30-33, 35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US00/17540

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KLEYN et al. Genetic Variation as a Guide to Drug Development. <i>Scienca</i> . 18 September 1998, Vol. 281, pages 1820-1821, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y	MORI et al. HLA Gene and Haplotype Frequencies in the North American Population. <i>Transplantation</i> . 15 October 1997, Vol. 64, No. 7, pages 1017-1027, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y	MORI et al. Computer program to predict likelihood of finding an HLA-matched donor. Methodology, validation, and application. <i>Biology of Blood and Marrow Transplantation</i> . October 1996, Vol. 2, pages 134-144, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y	MATISE, T. C. Genome Scanning for Complex Disease Genes Using the Transmission/Disequilibrium Test and Haplotype-based Haplotype Relative Risk. <i>Genetic Epidemiology</i> . 1995, Vol. 12, No. 6, pages 641-645, see entire document.	121,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y	COOPER et al. Network Analysis of Human Y Microsatellite Haplotypes. <i>Human Molecular Genetics</i> . 1996, Vol. 5, No. 11, pages 1759-1766, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y	GENE et al. Haplotype frequencies of eight Y-chromosome STR loci in Barcelona (North-East Spain). <i>International Journal of Legal Medicine</i> . 1999, Vol. 112, pages 403-405, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US00/17540

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CLARK et al. Haplotype Structure and Population Genetic Inferences from Nucleotide-Sequence Variation in Human Lipoprotein Lipase. American Journal of Human Genetics. 1998, Vol. 63, pages 595-912, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y	CASHMAN et al. The Irish cystic fibrosis database. Journal of Medical Genetics. 1995, Vol. 32, No. 12, pages 972-975, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y, P	TISHKOFF et al. The Accuracy of Statistical Methods for Estimation of Haplotype Frequencies: An Example from the CD4 Locus. American Journal of Human Genetics. August 2000, Vol. 67, No. 2, pages 518-522, see entire document.	1-21,30-33,35,43-51,53-58,69-78, 83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y	PERLIN et al. Toward Fully Automated Genotyping: Allele Assignment, Pedigree Construction, Phase Determination, and Recombination Detection in Duchenne Muscular Dystrophy. American Journal of Human Genetics. 1994, Vol. 55, No.4, pages 777-787, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160,171-183
Y	HOANG et al. PAH Mutation Analysis Consortium Database: A Database for Disease-producing and Other Allelic Variation at the Human PAH Locus. Nucleic Acids Research. 1996, Vol. 24, No. 1, pages 127-131, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160, 171-183
Y, P	STEPHENS et al. Single-nucleotide Polymorphisms, Haplotypes, and Their Relevance to Pharmacogenetics. Molecular Diagnosis. December 1999, Vol. 4, No. 4, pages 309-317, see entire document.	1-21,30-33,35,43-51,53-58,69-78,83-84,86,94-102,104-109,120-129,134-135,137,145-153,155-160, 171-183

**B. FIELDS SEARCHED**

Electronic data bases consulted (Name of data base and where practicable terms used):

DIALOG (files 5, 155) and EAST (files U.S. Patents, European abstracts, Japanese abstracts, and Derwent) search terms: pharmacogenomic, pharmacogenetic, haplotype, genotype, database, computer, clinical trial, population genetics, polymorphism, SNP, Hardy-Weinberg, Mendelian, linkage, phylogenetic, pedigree, locus, gene, phased, unphased

**BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING**

This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I, claim(s) 1-8, 69-72, and 120-124, drawn to a method of generating a haplotype database, computer-usable medium, and computer programmed therefore.

Group II, claim(s) 9-12 and 73, drawn to a method of predicting the presence of a haplotype and computer-usable medium therefore.

Group III, claim(s) 13-21, 74-78, and 125-129, drawn to a method of identifying correlation between haplotype pair and clinical response, computer-usable medium, and computer programmed therefore.

Group IV, claim(s) 22-29, 79-82, 130-133, drawn to a method for determining susceptibility to a condition/disease, computer-usable medium, and computer programmed therefore.

Group V, claim(s) 30-33, 83-84, and 134-135, drawn to a method for predicting response to treatment, computer-usable medium, and computer programmed therefore.

Group VI, claim(s) 34, 85, and 136, drawn to a method for generating a tree structure, computer-usable medium, and computer programmed therefore.

Group VII, claim(s) 35, 86, and 137, drawn to a method for displaying haplotype pair frequency, computer-usable medium, and computer programmed therefore.

Group VIII, claim(s) 36-37, 87-88, and 138-139, drawn to a method for displaying a linkage screen, computer-usable medium, and computer programmed therefore.

Group IX, claim(s) 38-40, 89-91, and 140-142, drawn to a method for displaying a phylogenetic tree screen, computer-usable medium, and computer programmed therefore.

Group X, claim(s) 41-42, 92-93, and 143-144, drawn to a method for displaying genotypic analysis, computer-usable medium, and computer programmed therefore.

Group XI, claim(s) 43-51, 94-102, and 145-153, drawn to a method to displaying clinical response values, computer-usable medium, and computer programmed therefore.

Group XII, claim(s) 52, 103, and 154, drawn to a method for carrying out a genetic algorithm, computer-usable medium, and computer programmed therefore.

Group XIII, claim(s) 53, 104, and 155, drawn to a method for displaying correlations, computer-usable medium, and computer programmed therefore.

Group XIV, claim(s) 54-55, 105-106, and 156-157, drawn to a method for conducting a clinical trial, computer-usable medium, and computer programmed therefore.

Group XV, claim(s) 56-58, 107-109, and 158-160, drawn to a method for inferring genotype, computer-usable medium, and computer programmed therefore.

Group XVI, claim(s) 59-68, 110-119, and 161-170, drawn to a method of determining polymorphic sites or subhaplotypes, computer-usable medium, and computer programmed therefore.

Group XVII, claim(s) 171-175 and 183, drawn to a data structure.

Group XVIII, claim(s) 176-182, drawn to a method for storing and organizing biological information.

The inventions listed as Groups I-XVIII do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The special technical feature of each method is the starting materials, method steps, and goal of each method. The corresponding computer-usable medium and computer programmed therefore form part of the inventive concept with each method. Note that PCT Rule 13 does not provide for multiple methods or products.

## NOTES TO FORM PCT/ISA/220 (continued)

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:  
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:  
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:  
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or  
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:  
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

### "Statement under Article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

The statement should be brief, it should not exceed 500 words if in English or if translated into English.

It should not be confounded with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It should not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

### In what language ?

The amendments must be made in the language in which the international application is published. The letter and any statement accompanying the amendments must be in the same language as the international application if that language is English or French; otherwise, it must be in English or French, at the choice of the applicant.

### Consequence if a demand for international preliminary examination has already been filed ?

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

### Consequence with regard to translation of the international application for entry into the national phase ?

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.